



Department for the Economy

CALL FOR EVIDENCE: DEVELOPING BIOMETHANE PRODUCTION IN NORTHERN IRELAND

NIE Networks' Response

23rd August 2024

ABOUT NIE NETWORKS

1. Northern Ireland Electricity Networks (NIE Networks) is the owner of the electricity transmission and distribution networks in Northern Ireland (NI), transporting electricity to 910,000 customers, including homes, businesses and farms.
2. There are 2,300 km of transmission network, 47,000 km of distribution network and 340 major substations, including 60 serving large wind farm sites in Northern Ireland.
3. Our role is to maintain and extend the electricity infrastructure across Northern Ireland, connect demand and generation customers to the network, and ensure that our equipment is safe and reliable. We also provide electricity meters and metering data to suppliers and market operators.
4. To do this we directly employ more than 1,500 people and we sustain many hundreds of jobs through our contract and supply chain. Through employment, taxes and supplier contributions, we contribute over £150 million annually to the local economy in Northern Ireland.
5. NIE Networks does not supply electricity. Customers receive their electricity bill from their chosen electricity supplier, of which there are currently five operating in Northern Ireland. Nor do we own generation assets of any kind.
6. NIE Networks is a regulated company and our business activities are overseen by the Northern Ireland Authority for Utility Regulation (the Utility Regulator). Our business plan for delivering our services to customers is approved for a number of years ahead, with the current price control period set to run until 2025. Our next price control period will run from 2025 to 2031.
7. We work closely with the System Operator for Northern Ireland (SONI), who operate the transmission network and are responsible for the planning of transmission infrastructure projects in Northern Ireland. While NIE Networks and SONI are separate companies, with different responsibilities, we work in close partnership, in particular to deliver the programme of transmission investment projects from a capacity and reliability basis.
8. As the asset owner and manager, NIE Networks develops the network and constructs new assets as they are required. We also set the parameters within which SONI can operate our assets.

ON THE CALL FOR EVIDENCE

1. NIE Networks welcomes the opportunity to respond to this call for evidence which is of particular importance in Northern Ireland considering the unique opportunities within the local agricultural industry. We have offered responses to a number of the Department's specific questions below; however, many do not fall within our area of expertise and on these we do not provide an opinion.

General Comments

2. We consider that the biogas potential in Northern Ireland is significant and will have an important role to play in Northern Ireland's journey to net zero.
3. However, it is imperative that the optimal primary role of biogas in Northern Ireland's journey to net zero is given careful consideration, particularly with respect to the continued cost pressures felt by consumers. Whilst Q1 of this call for evidence does ask for views relating to the primary role of biomethane, most of the document focusses on its use relating to the decarbonisation of the gas network. Whilst a viable potential use, careful consideration and analysis should also be given to the use of biogas for electricity generation purposes and whether, as a primary use, provides a more optimal outcome for the people of Northern Ireland. We elaborate further on this in our response to Q1.
4. We believe that this reinforces previous comments that we have submitted within our response to the consultation on Design Considerations for a Northern Ireland Smart Systems and Flexibility Plan relating to the need for a net zero vision for Northern Ireland, reiterated below for convenience:
5. This call for evidence document considers only one of many topics which may be critical in achieving net zero. Whilst detailed consideration must be given to each of these areas within their own right, they are interrelated and many will be complementary, however, some may also be contradictory. Each individual workstream or topic when considered in isolation may reach a different conclusion compared to when considered through the lens of a 'whole energy system'.
6. We consider that there is a need to develop a net zero vision for Northern Ireland to ensure a coordinated approach to a net zero future. In the absence of this vision, other plans could emerge which might not individually or collectively align with a Northern Ireland wide vision or policy and which might therefore provide conflicting signals to developers and investors. This vision should take into account the certainty around the future landscape, including availability and economics of these potentially decarbonised energy vectors.
7. We believe the absence of a net zero vision for Northern Ireland creates the risk of a disjointed, and less optimal approach to the delivery of net zero. Whilst acknowledging that section 2 of the NI Energy Strategy¹ does provide some commentary on "Energy Strategy Vision" we consider that this will require further detailed development, particularly from a 'whole energy system' perspective. This would enable a more co-ordinated approach towards a net zero future and allow for a more focussed effort from a finite resource pool in Northern Ireland.
8. Finally, whilst this is an important call for evidence and we welcome and support the ongoing efforts by various Departments relating to the development of energy strategy and policy it is imperative that policy progress is made in areas which are ready to deliver immediate benefit to Northern Ireland and its legislative requirements. For example, we would propose that urgent progress is made with respect to the decarbonisation of home heating, which has had longstanding policy support in neighbouring jurisdictions.
9. In addition to our remarks here, we stand by to assist the Department with further development of renewable energy policies.

Specific Comments

Question 1: What are your views on the primary role that biomethane might play in supporting our path to net zero, e.g:

- **decarbonising the gas network?**
- **sustainable transport fuel?**
- **for direct use by industry?**
- **other uses?**

¹ NI Department for the Economy, The Path to Net Zero Energy, 16 December 2021, <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Energy-Strategy-for-Northern-Ireland-path-to-net-zero.pdf>

10. The Queen's University Belfast paper² indicates potential biomethane availability to the level of 80% of Northern Ireland (NI) gas distribution demand, therefore, the potential for locally produced renewable gas is real due to the size of the local agricultural sector. Today, some businesses in NI are already using biogas from anaerobic digestion (AD) for heat in industrial processes, as a fuel for transport and for generation of electricity. Biomethane could be an attractive like for like replacement for fossil gas, depending on price, where an industrial process cannot easily or cost-effectively be electrified.
11. Industrial gas demand for heat and transportation, while less seasonal as opposed to domestic demand for heat, could potentially be an efficient use of the biomethane resource where compression to transmission and storage may be avoided. Domestic gas demand for heating homes would by nature be more seasonal which would imply that the biomethane gas would need to be compressed to transmission levels and stored to allow for continuous availability. Both compression and storage come with additional capital and operational costs, which would ultimately be passed to customers.
12. However, it is widely understood that the route to decarbonisation of most energy demand will be electrification, through a high RES-E system and with heat pumps bringing whole system efficiency, and plans are in place to achieve that high penetration of renewables. We already observe household and industrial customers moving to electrification, though certain policy measures, akin to those in place in other jurisdictions, will be necessary to increase the scale and pace of that transition.
13. On electricity generation, at August 2024 there is 107 MW of biogas generation connected to the electricity network across Northern Ireland, including 18 MW of large scale (> 5 MW) generation. This biogas generation fleet contributed 6.7% of the renewable generation in NI during the period April 2023 to March 2024³. A further 23 MW of small scale (< 5 MW) generation is committed, which will further contribute to the 80% RES-E ambition set in the Climate Change Act (Northern Ireland) 2022⁴. One advantage of generation from renewable biogas is that it is not intermittent in the way that solar PV and wind generation is. Gas transmission network demand for power generation is today roughly equal to gas distribution network demand.
14. Use of biomethane, or biogas (without refinement to biomethane), for electricity generation, could possibly be a more efficient whole system solution where a household or industrial customer is using a heat pump, with a coefficient of efficiency significantly in excess of one, than burning the gas in a boiler.
15. In addition to earning revenue from selling electricity, most biogas generation has been supported by sales of Renewable Obligation Certificates (ROCs) through the NI Renewables Obligation (NIRO), administered by Ofgem. Further, depending on individual circumstances, biogas generation from AD can receive revenue from taking waste as feedstock, from heat and from digestate.
16. The use case for renewable gas will depend in part on its price. Just as with renewable generation through the NIRO scheme and the forthcoming Renewable Energy Support Scheme, renewable gas for injection into the gas network probably needs price support to make it more attractive for consumers. However, the required level of price support will likely depend on the use case and the capital and operational costs of the necessary network infrastructure.
17. If biomethane is available (and potentially stored) at transmission level, it is intuitive that a large thermal generator might source that gas for its generation, which will be increasingly intermittent in a high RESE world where most power is generated by wind and solar. For power generation, the price premium associated with renewable gas fuel would need to be balanced against the alternative need to capture carbon emissions from burning fossil gas, for which NI has no planned infrastructure, or the need to build new thermal generation and associated infrastructure for hydrogen, for example.
18. The use of biogas for electricity generation deserves to be more fully considered with an assessment conducted to determine what is the most optimal primary use of biogas/biomethane in Northern Ireland's journey to net zero.

Question 2: What are your views on how the optimal use of biomethane might evolve over time, i.e:

- **in the short-term (up to 2028);**
- **in the medium-term (up to 2035);**
- **and in the long-term (up to 2050 and beyond)**

² Neha Mehta, Aine Anderson, Christopher R. Johnston, David W. Rooney, Evaluating the opportunity for utilising anaerobic digestion and pyrolysis of livestock manure and grass silage to decarbonise gas infrastructure: A Northern Ireland case study, <https://doi.org/10.1016/j.renene.2022.06.115>

³ NI Department for the Economy, Electricity Consumption and Renewable Generation in Northern Ireland, 6 June 2024, <https://www.economy-ni.gov.uk/articles/electricity-consumption-and-renewable-generation-statistics>

⁴ Climate Change Act (Northern Ireland) 2022, <https://www.legislation.gov.uk/nia/2022/31/contents/enacted>, section 15: 'The Department for the Economy must ensure that at least 80% of electricity consumption is from renewable sources by 2030.'

19. We understand that biomethane injection into gas network is taking place, although customers report that it is not available to them through their supplier. Today, availability of biomethane through the existing natural gas network does not appear to satisfy a typical customer need for a secure supply of renewable energy at an affordable price.
20. In the medium term, we foresee certain industrial demand using biomethane, but this depends on availability of a certification scheme and confidence in pricing.
21. As alluded to above, careful consideration should be given to the use of biogas for electricity generation with an assessment conducted to determine what is the most optimal primary use of biogas/biomethane in Northern Ireland's journey to net zero. Furthermore, Biogas generation, which is supported by the NIRO and contributes to the RES-E measure, will cease receiving support through ROCs between 2027 and 2037. There is a question about whether or by what means such facilities should be supported beyond this date. Potentially, these existing units could be expanded, for economy of scale, and they could continue to contribute to the RES-E ambition.
22. In the medium term, biomethane for household heating could be limited due to factors such as pricing and availability, but also the relative pricing of gas and electricity. To explain: decarbonisation of heating using an electric heat pump is a more energy efficient solution than burning biomethane. We expect capital support will be available for conversion to a heat pump, at least for some customers. However, a customer will also take into account operating costs. Here, the difference in price between gas and electricity is an important factor and, as that gap narrows, customers will benefit more in lower operating costs from conversion to a heat pump. Therefore, the price support necessary to facilitate uptake of biomethane, if added to the price of gas bills, actually has the effect of narrowing the price differential between gas and electricity, thereby encouraging electrification.

Question 9: Do you think the development of the local biomethane sector should be based on large-scale, centralised AD plants? Why/why not?

23. It is intuitive that larger scale AD plants would provide an economy of scale. Many of the biogas generators connected to the electricity network today are sized to benefit from ROCs. We have heard from some operators of these plants that they would be interested in expanding their facility, to generate more electricity, particularly as the NIRO comes to an end. However, we recognise the merit of AD plants that are located and sized according to local need – for waste management, power, heat, digestate management, network access, etc.

Question 20: In your view, would

(i) domestic customers;

(ii) small to medium-sized businesses; or

(iii) large energy users

be willing to pay a premium to purchase biomethane, i.e. per kWh? If so, how much?

24. It is difficult to answer this question as it depends on many external and changeable factors. However, what is clear is that customers will expect that the optimal primary role of biogas/biomethane in the context of Northern Ireland's journey to net zero is supported through appropriate Government policy.

Question 24: What are your views on how connection-related costs should be allocated in respect of single injection site connections and hubs?

25. There are similarities with charging for connections to the electricity network, but the arrangements are not exactly equivalent. Where we need to adapt an electricity substation for reverse power flow, that is a relatively small capital investment and there is no significant ongoing operating cost. In the case of gas, we understand that there are more significant operational costs associated with compression from distribution to transmission.
26. The renewable generation cluster approach has been very successful in NI – facilitating connection of large quantities of renewable generation to the distribution network, at proportionate cost to the generators and low risk to consumers as a whole. We are presently working up proposals for adjustments to this regime to connect more renewable generation at scale and pace. It is possible that a similar model could be developed for renewable gas, with operational as well as capital costs shared proportionately.
27. We note the call for evidence on the electricity connection policy framework, including connection charging, published by the Department for the Economy and the Utility Regulator⁵, and anticipate a further consultation on options for reform of electricity connection charging. This could provide options that might be mirrored for renewable gas.
28. Already the post-alised gas network tariff structure socialises network costs across all gas consumers. Socialisation of connection-related costs, including network operational costs, could similarly be socialised across all gas customers.

⁵ Department for the Economy and Utility Regulator, Electricity Connection Policy Framework Review – Call for Evidence, <https://www.economy-ni.gov.uk/articles/electricity-connection-policy-framework-review>.



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